Region 1 FY 2012 Invasive Species Control Program Proposal Format

Refuge/complex name: Rose Atoll NWR / Pacific Reefs NWR Complex

Project title: Eradication of invasive ants from Rose Atoll

Project description: This effort aims to eradicate invasive ants from Rose Atoll. While we will be conducting a thorough survey of ants on Rose Atoll in April 2012, *Pheidole megacephala* and *Tetramorium bicarinatum* are already known to occur there. These ants are severely disrupting the ecology of the atoll, including facilitating an outbreak of *Pulvinaria urbicola*, an invasive scale insect responsible for killing *Pisonia grandis* trees. These aggressive, predatory ants are also likely reducing numbers of arthropods native to the atoll. Once ants are removed, natural enemies of the scale, such as predaceous beetles and parasitic wasps that may now be prevented from attacking the scale by the ants, would be expected to increase in number and to reduce scale abundances to a level better tolerated by *Pisonia*.

Due to the small size of Rose Island, it is likely that all 14 acres of habitat are infested with ants. The small size of the island also makes complete eradication of ants far more likely than on a large island. Because Sand Island (7 acres) is currently devoid of vegetation, it may be unsuitable for ants, but if ants are detected, eradication efforts will take place there as well.

Ants will be eradicated through the use of fast-acting, commercially available insecticidal baits designed specifically to control ants. Once ants are eradicated, effective quarantine of materials brought to the atoll should prevent re-establishment of ants. Recovery of arthropods affected by ants should begin immediately following eradication. We will be able to use the detailed survey and ant mapping data from our April survey to ensure that we have the most effective distribution of bait stations to eradicate ants from the island.

What is the potential for eradication of the invasive species? While eradication of invasive ants can be difficult, the small size of Rose Island makes the chances of successfully eradicating ants high. Bait-based methods have already proven for eradicating *P. megacephala*, the more aggressive of the two species, In contrast, to our knowledge, there have been no direct attempts to eradicate *T. bicarinatum* in a natural setting. However, an effort to eradicate the aggressive *Solenopsis geminata* from Spit Island on Midway Atoll reduced abundances of *T. bicarinatum* to levels barely detectable with bait, suggesting that a focused effort could eradicate *T. bicarinatum* from Rose Atoll. Efficacy testing of several baits aimed to eradicate *T. bicarinatum* would be conducted in Hawaii prior to use on Rose Atoll. Eradication of *P. megacephala* has been achieved following a single treatment elsewhere, but more than one application may be required on Rose Atoll.

Does the project support achieving the refuge purpose? Yes. The refuge purpose …for the development, enhancement, management, conservation and protection of fish and wildlife resources… would be supported by eradicating ants. Ants have been introduced to Rose Atoll NWR and are not a part of the natural ecosystem. They directly affect birds, turtles, arthropods and other wildlife by actively competing with them for resources and though aggressive behavior

towards these native species. Ants also affect the habitat of Rose Island by tending to the scale insects infesting the *Pisonia* trees.

Does the project support biological integrity? Yes, due to their aggressive nature, ants can have direct effects on wildlife and habitat. Because Rose Island is a rare uninhabited island, it provides vital nesting habitat for sea birds and sea turtles. Eradicating ants will make Rose Island a far more useful refuge for these species. *Pisonia* trees are declining throughout their range, and the eradication of ants will facilitate the removal of *Pulvinaria* scale and help in the recovery of an isolated *Pisonia* forest.

Will the project involve support from partners? Yes, this project will be completed in cooperation with U.S. Geological Survey, University of Hawaii at Hilo (UHH), American Samoa Community College (ASCC), and American Samoa's Department of Marine and Wildlife Resources (DMWR). Ant identification and eradication experts from USGS and UHH will be contracted to lead the project. USGS will contribute $5,000 in salary for the USGS principal investigator, Paul Banko, laboratory space, GPS equipment and some entomological supplies. DMWR and ASCC will both contribute highly qualified personnel to the project, who will be vital in post-treatment monitoring of ecosystem health. Working closely with our territorial and federal partners a vital part of fulfilling the Service mission in American Samoa.

What monitoring will be used to evaluate the project? We will be conducting an entomology-based survey of Rose Atoll in April 2012. This survey will result in a detailed, grid-based GIS map of ant populations, as well as a survey of other arthropods, including measurement of *Pulvineria* scale abundance and their natural enemies. Ant eradication would be initiated in late summer or early fall 2012, and will be greatly improved by this recent, detailed ant survey.

Several post-treatment monitoring events over the course of one year will be required to confirm that ants have been eradicated. Monitoring of *P. megacephala* and *T. bicarinatum* is relatively simple (using a dollop of canned tuna on a bait card) and if necessary, can be conducted by the Refuge Manager during regular visits to Rose Atoll. If ants are detected after treatment, then a second application of insecticidal bait will be scheduled as soon as possible, followed by additional post-treatment monitoring.

Post-treatment monitoring will also include measuring abundances of *Pulvinaria* scale and its natural enemies, the health and reproduction of *Pisonia* trees, and abundances of native arthropods. Due to the rarity at which ants have been eradicated from oceanic islands, successful removal of ants from Rose Atoll, and the expected recovery of ecosystem health will act as a model for managers of other remote islands.

Budget: A total of $38,950 is requested to carry out field trials in Hawaii and to attempt ant eradication on Rose Atoll. Funds will be used for field staff salary ($28,950), equipment and supplies ($1,600), and travel (8,400). Matching funds for PI salary and some equipment will be provided by USGS.